

REMARKS

CLAIM REJECTIONS – 35 USC 103

Claims 67, 70 and 72-76 are rejected under 35 USC 103(a) as being unpatentable over Fai Lai (US 6217716) in view of Kardokus et al (US 611761). The Applicant respectfully disagrees.

Claim 67 recites:

“A three-dimensional physical vapor deposition target, comprising:

a material comprising one or more of Cu, Ni, Co, Ta, Al, and Ti;

an average grain size of less than or equal to 250 microns within the material;

a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow and an exterior surface extending around the second end at rounded corners; and

a sputtering surface defined along the interior surface of the cup, wherein the target is monolithic and comprises a cast ingot.”

Claim 67 is herein amended to recite that the exterior surface extending around the second end has rounded corners, which is different from the Fai Lai target, which has square corners. The original Specification, on page 13, states that rounded corners are not insignificant in that:

“[0064] An advantage of forming curved corners 304 is that such can simplify the process of Figs. 14 and 15 relative to formation of more square or angled corners. Specifically, it is found that the compression within press 50 of Figs. 14 and 15 can be difficult relative to substantially square corners, in that there can be poor material flow around such square corners. However, utilization of curved corners can enhance material flow, and thus improve the quality of a product formed by the compression of Figs. 14 and 15. It is noted that although only some of the square corners associated with the external periphery 309 of target 300 have been rounded, other corners (such as, for example, the corners labeled as 310 and 312) can be rounded in other embodiments of the invention. An advantage of not rounding corners 310 and 312 can be that a target apparatus comprising substantially square corners 310 and 312 will fit within a prior art Applied MaterialsTM sputtering apparatus without modification to either the target or the apparatus. An advantage of rounding at least some of the corners of a three-dimensional target construction is that such can reduce an amount of material incorporated into the target construction, and thus reduce an expense associated with the material of the target construction.”

Therefore, it stands to reason that one would not read Fai Lai and consider this application, alone or in combination with Kardokus, to produce the claims of the current application.

Kardokus does not cure the obvious deficiencies of Fai Lai, specifically the issue of a three dimensional target, because Kardokus does not disclose a three-dimensional target, as is disclosed in the present application. The Examiner is invited to review the original specification – paragraph [0013], which discusses the inherent differences in Kardokus and the current application. Therefore, claim 67 is considered allowable, along with the related dependent claims, in view of Fai Lai and/or Kardokus.

Claim 68 is rejected under 35 USC 103(a) as being unpatentable over Fai Lai (US 6217716) in view of Kardokus et al (US 611761) as applied to claims 67, 70 and 72-76, and further in view of Kulkarni (US 6283357). The Applicant respectfully disagrees.

Claim 67 recites:

“A three-dimensional physical vapor deposition target, comprising:

a material comprising one or more of Cu, Ni, Co, Ta, Al, and Ti;

an average grain size of less than or equal to 250 microns within the material;

a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow and an exterior surface extending around the second end at rounded corners; and

a sputtering surface defined along the interior surface of the cup, wherein the target is monolithic and comprises a cast ingot.”

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that although only some of the square corners associated with the external periphery 309 of target 300 have been rounded, other corners (such as, for example, the corners labeled as 310 and 312) can be rounded in other embodiments of the invention. An advantage of not rounding corners 310 and 312 can be that a target apparatus comprising substantially square corners 310 and 312 will fit within a prior art Applied MaterialsTM sputtering apparatus without modification to either the target or the apparatus. An advantage of rounding at least some of the corners of a three-dimensional target construction is that such can reduce an amount of material incorporated into the target construction, and thus reduce an expense associated with the material of the target construction.”

Therefore, it stands to reason that one would not read Fai Lai and consider this application, alone or in combination with Kardokus, to produce the claims of the current application.

Kardokus does not cure the obvious deficiencies of Fai Lai, specifically the issue of a three dimensional target, because Kardokus does not disclose a three-dimensional target, as is disclosed in the present application. The Examiner is invited to review the original specification – paragraph [0013], which discusses the inherent differences in Kardokus and the current application.

The Kulkarni reference discloses a clad hollow cathode magnetron sputter target that is made from a plate of sputter target material and a sheet of cladding material. Kulkarni specifically explains that the benefit of the Kulkarni disclosure is that it solves the problems inherent with monolithic targets, including cost and weight (see Abstract, among other sections). The present application, including the independent claims, covers targets that are produced from ingots and cast ingots that are ultimately formed into monolithic targets, which is exactly the opposite of Kulkarni.

Therefore, claim 67 is considered allowable, along with the related dependent claims, in view of Fai Lai, Kulkarni and/or Kardokus. In addition, dependent claim 68 is allowable by virtue of its dependency on independent claim 67.

Claim 69 is rejected under 35 USC 103(a) as being unpatentable over Fai Lai (US 6217716) in view of Kardokus et al (US 611761) as applied to claims 67, 70 and 72-76, and further in view of Michaluk (WO 00/31310). The Applicant respectfully disagrees.

Claim 67 recites:

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a material comprising one or more of Cu, Ni, Co, Ta, Al, and Ti;

an average grain size of less than or equal to 250 microns within the material;

a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow and an exterior surface extending around the second end at rounded corners; and

a sputtering surface defined along the interior surface of the cup, wherein the target is monolithic and comprises a cast ingot.”

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Therefore, it stands to reason that one would not read Fai Lai and consider this application, alone or in combination with Kardokus, to produce the claims of the current application.

Kardokus does not cure the obvious deficiencies of Fai Lai, specifically the issue of a three dimensional target, because Kardokus does not disclose a three-dimensional target, as is disclosed in the present application. The Examiner is invited to review the original specification – paragraph [0013], which discusses the inherent differences in Kardokus and the current application. Michaluk does not cure the obvious deficiencies of Fai Lai, Kardokus, alone or in combination with one another.

Therefore, claim 67 is considered allowable, along with the related dependent claims, in view of Fai Lai, Michaluk and/or Kardokus. In addition, dependent claim 69 is allowable by virtue of its dependency on independent claim 67.

Claim 71 is rejected under 35 USC 103(a) as being unpatentable over Fai Lai (US 6217716) in view of Kardokus et al (US 611761) as applied to claims 67, 70 and 72-76, and further in view of Pavate et al. (US 6391163). The Applicant respectfully disagrees.

Claim 67 recites:

“A three-dimensional physical vapor deposition target, comprising:

a material comprising one or more of Cu, Ni, Co, Ta, Al, and Ti;

an average grain size of less than or equal to 250 microns within the material;

a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow and an exterior surface extending around the second end at rounded corners; and

a sputtering surface defined along the interior surface of the cup, wherein the target is monolithic and comprises a cast ingot.”

Claim 67 is herein amended to recite that the exterior surface extending around the second end has rounded corners, which is different from the Fai Lai target, which has square corners. The original Specification, on page 13, states that rounded corners are not insignificant in that:

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that although only some of the square corners associated with the external periphery 309 of target 300 have been rounded, other corners (such as, for example, the corners labeled as 310 and 312) can be rounded in other embodiments of the invention. An advantage of not rounding corners 310 and 312 can be that a target apparatus comprising substantially square corners 310 and 312 will fit within a prior art Applied MaterialsTM sputtering apparatus without modification to either the target or the apparatus. An advantage of rounding at least some of the corners of a three-dimensional target construction is that such can reduce an amount of material incorporated into the target construction, and thus reduce an expense associated with the material of the target construction.”

Therefore, it stands to reason that one would not read Fai Lai and consider this application, alone or in combination with Kardokus, to produce the claims of the current application.

Kardokus does not cure the obvious deficiencies of Fai Lai, specifically the issue of a three dimensional target, because Kardokus does not disclose a three-dimensional target, as is disclosed in the present application. The Examiner is invited to review the original specification – paragraph [0013], which discusses the inherent differences in Kardokus and the current application. Pavate does not cure the obvious deficiencies of Fai Lai, Kardokus, alone or in combination with one another.

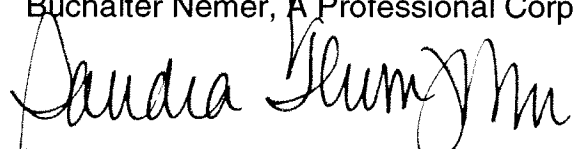
Therefore, claim 67 is considered allowable, along with the related dependent claims, in view of Fai Lai, Pavate and/or Kardokus. In addition, dependent claim 69 is allowable by virtue of its dependency on independent claim 67.

REQUEST FOR ALLOWANCE

Claims 67-76 are pending in this application and the Applicant respectfully requests that the Examiner reconsider all of the claims in light of the arguments presented and allow all current and pending claims.

Respectfully submitted,

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